PART 1

# Fundamentals

Chapter 1

# NATIONAL INCOME ACCOUNTING

National income accounting is important to students of income analysis for two distinct reasons. One is that it provides a structural picture of the economy and a set of definitions on which income theory is built. The other is that it provides a body of useful statistics.

Since this is a book on income theory, it is accounting as the foundation for the theory that occupies the center of the stage. But the second part of this chapter takes a brief excursion into the wings to consider some of the problems of compiling the statistics and to ask exactly what it is the statistics measure.

## ACCOUNTING CONCEPTS

### *"Stocks" and "Flows"*

At the start it is necessary to distinguish between two kinds of measures: the amount of a *stock* at a given point in time (for example, the water in a reservoir on July 1, 1959) and the amount of a *flow* over a period of time (say the quantity of water flowing into or out of the reservoir between July 1, 1959, and July 1, 1960).

In business accounting, the *balance sheet* is a statement of stocks—the amount of a firm's assets, liabilities, and net worth at a particular moment of time. The *income statement* of the firm is a measure of certain flows—the receipts and expenditures of the firm during a period of time.

In national income accounting, as the name suggests, we are primarily interested in something like an income statement—a set of flows. Our interest in stocks is secondary; they enter the theory at those points where they may exert an influence on the flows.

### *Income = Production*

The income of a nation during a year consists of the goods and services produced by it during that year. For every dollar of current output, a

dollar of claim upon that output is created. If the total claims on producers created during the production process are less than the value of output, then the residual is profit—the producers' claim. If the total claims on producers exceed the value of output, the producers' claim is negative—a loss. In either case, the total claims, or current income, must add up to total current output. Thus, total income and total product are the same thing looked at from different points of view. The same figure is obtained by adding up either the total value of output or the total of incomes generated in the process of producing that output.

### *Intermediate and Final Products*

In a complex economy, most products will pass through several firms before they become finished or final products. A product sold by one firm to another which will use it for further production in the same income period is called an "intermediate product." Clearly, if all the production of all firms were added up, there would be multiple counting of those products that passed through the hands of more than one firm. To avoid such multiple counting, two approaches are possible.

The first takes the value of product of each firm and deducts the value of intermediate products (inputs purchased from other firms). This gives the *value added* by each firm, and the sum of values added equals total product.

Alternatively one can add up the value of final products.

### *Components of Output*

A number of different ways of breaking down total output can be used. One way is to show value of output by industrial origin, as in Table 1. This tabulation is arrived at by deducting intermediate products from the production of each industry to obtain a value-added type of measure. Another method is to classify output according to the nature of the final use of the product. The choice is determined by the use to which the information is to be put; and while, for certain purposes, output data by industrial origin are valuable, for purposes of income analysis, output grouped according to type of final demand is even more serviceable.

An important facet of income theory is to explain what determines the amount of output demanded, and for that task it is helpful to group together products for which the determinants of demand are broadly similar. Three categories, consumption, investment, and government purchases of goods and services, will be defined, each representing a different set of demand forces. A second reason for choosing this division of output



future levels of income. Consumption and investment may be further subdivided to take into account the differences in the determinants of demand that may apply to components of those categories.

TABLE 1

NATIONAL INCOME BY INDUSTRIAL ORIGIN, 1957
(Millions of Dollars)

| | |
|---|---|
| Agriculture, forestry, and fisheries | 16,229 |
| Mining | 6,191 |
| Contract construction | 19,648 |
| Manufacturing | 112,517 |
| Wholesale and retail trade | 59,622 |
| Finance, insurance, and real estate | 34,611 |
| Transportation | 17,258 |
| Communications and public utilities | 13,340 |
| Services | 39,340 |
| Government and government enterprises | 42,869 |
| Rest of the world | 2,244 |
| National Income | 363,951 |

Source: U.S. Department of Commerce, *Survey of Current Business*, July, 1958, Table 6.

### *Consumption and Investment*

Consumption and investment cannot be distinguished by the physical appearance of the commodity. The purchase of an automobile may be either consumption or investment. The purchase of a pair of shoes may be either consumption or investment. They are defined in terms of certain accounting practices which, in turn, are intended to reflect certain economic realities.

Economic activity may be viewed as a series of transactions between buyers and sellers. In the case of some transactions, the buyer and seller may be the same party (e.g., a farmer "buying" some of his food products for his own consumption), and it becomes necessary to impute a transaction; but in a highly specialized or exchange economy, buyers and sellers are ordinarily different parties, and most transactions are observable. In principle, the distinction between imputed and observable transactions need not concern us.

Transactions are of two kinds: current and capital. A seller is engaged in a current transaction when he sells current product, i.e., product which has been produced in the accounting period under consideration. When the item sold is the product of some previous income accounting period, the exchange is, from the seller's point of view, a capital transaction.

To the buyer, whether a transaction is current or capital depends

on how it is treated in his accounting. If he is a producer, what he buys are inputs for production. If the inputs are to be used up in producing the output of the current period, the purchase is a current transaction and is all charged off as a cost of producing current product. If, however, the item has a life longer than the current period and will be used in production in succeeding periods, it has been bought on capital account. Its cost will not all be charged to current production but will be spread over the production of the succeeding periods to which it contributes.

If the buyer is a consumer rather than a producer, his purchases will not be used for production; they will be consumed in the current period and are, therefore, current transactions.

Since there are two parties to a transaction, buyer and seller, and since, to each, the transaction can be current or capital, there are four possible classes of transactions. These are shown in Figure 1.

FIGURE 1

CURRENT AND CAPITAL TRANSACTIONS

| SELLER \ BUYER | CURRENT | CAPITAL |
|---|---|---|
| CURRENT | 1 | 2 |
| CAPITAL | 3 | 4 |

In Box 1 are transactions which are current to both seller and buyer. Since we are washing out intermediate products and dealing only with final products, sales by producers to other producers on current account are eliminated and we have left sales of current product to consumers. *Consumption* may therefore be defined as transactions which are current to both sellers and buyers.

In Box 2 we have sales of current product to producers who buy it on capital account. Current product has been bought to be used in future production. Such purchases are *investment*, defined as transactions which are current to the seller and capital to the buyer.

In Box 3 we have items sold on capital account and bought on current account. This would occur, for example, if a business sold a company



transaction, which removes something from the stock of goods used in production, is the exact reverse of investment, which adds to the stock of producing assets. We can, therefore, call it *disinvestment*—a transaction capital to the seller and current to the buyer.

In Box 4 are transactions which are on *capital* account to both buyer and seller. The sale of a piece of land is an example. The land is not current product nor can it be bought on current account. The transaction is merely a change in ownership of an asset and it does not enter into the national income and product accounts, which are affected only by current transactions.

These definitions will help to clear up some common confusions. To take just one, the ordinary usage of the term "investment" is not the same as the economist's use of it. An individual may speak of investing in land or bonds, but they are not acts of investment in the economic sense. Current product has not been bought on capital account; there is no addition to the stock of assets to be used in production.

### Government Purchases of Goods and Services

The simplest and most logical accounting approach to the government sector would be to treat government as a producer. Government is a producer of services. It produces with two kinds of inputs: product purchased from other producers and labor hired directly. Some of the purchases from other producers will be used up in the current period and some will contribute to production of services in succeeding periods. The output of services will be either intermediate products going to other producers or will be final products going to consumers.

Statistical realities, however, have compelled a modification of this treatment. One important characteristic of government product is that it is not sold but given away. Its value cannot be measured, as private product is, by the prices at which it is sold. Furthermore, the beneficiaries of government services may be producers or consumers, and which they are cannot readily be determined, so that it is difficult to separate government product into intermediate goods and final goods.

For such reasons, most accounting systems follow the practice of treating government output as entirely final product, valued at cost (the cost of product purchased from producers plus the cost of labor services bought by the government). A consequence of this method is that all government purchases are charged to current production, i.e., treated as if they were all used up in the current period, so that there is no category of government investment.

ally "government production of consumer services." It is kept separ-
rather than lumped in with personal consumption because it responds
different set of forces from those that explain personal consumption
and.

### Gross National Product

The estimated total value of the output of an economy in an income
unting period (typically a year) is called the "gross national prod-
' It is "gross" because no deduction has been made for the amount
apital stock that was used up in producing the national product. The
:al stock of the economy is the collection of productive assets, accu-
ated through investment in previous periods, which last over a num-
of income periods. Some portion of the capital stock can be imagined
: used up in each period, and, to that extent, part of the capital stock
mes embodied in the current product. The gross national product is,
efore, an overstatement of current product, since it contains what was
ally the product of some previous period. To adjust for this overstate-
t, an estimate of the capital used up is deducted from gross national
uct, giving what is called "net national product."

In Table 2 we have the 1957 estimate of U.S. gross national product,
led into consumption, investment and government purchases, with
subdivisions under each of these headings.

The subdivisions of consumption and government purchases are

TABLE 2

U.S. GROSS NATIONAL PRODUCT, 1957
(Billions of Dollars)

| | | |
|---|---|---|
| Personal consumption expenditures | | 284.4 |
| Durable goods | 39.9 | |
| Nondurable goods | 138.0 | |
| Services | 106.5 | |
| Gross private investment | | 68.8 |
| Gross domestic investment | 65.3 | |
| New construction | 36.5 | |
| Producers' durable equipment | 27.9 | |
| Change in business inventories | 1.0 | |
| Net foreign investment | 3.5 | |
| Government purchases of goods and services | | 87.1 |
| Federal | 50.8 | |
| State and local | 36.3 | |
| Gross National Product | | 440.3 |

Source: U.S. Department of Commerce, *Survey of Current Business*, July, 1958,



self-explanatory, but two of the components of investment will require some brief discussion: change in business inventories and net foreign investment.

### Change in Business Inventories

Inventories are stocks of materials, semifinished goods, and finished goods held by producers. They are part of a stream of goods flowing through the firm in the productive process, in contradistinction to fixed assets. Thus tractors, though producers' durables to farm operators, are inventory to tractor manufacturers and dealers.

A net increase of inventories in the economy does not differ, in the broadest sense, from investment in producers' durables. It is current product acquired on capital account. Producers want to invest in inventories for the same reason they want to invest in durables: they are assets that will make a productive contribution to the operations of the enterprise. But "change of inventories" has certain distinctive characteristics which make it advisable to separate it from investment in producers' durables.

First, the flexibility of inventories in a *downward* direction is high compared to that of producers' durables. Disinvestment in producers' durables must take place through the wearing out of those assets (with the exception of a negligible part of the capital stock that might be shifted to consumer use in its existing form). The time rate of such disinvestment is fixed by technical conditions. Disinvestment in inventories, on the other hand, occurs when the flow of production is less than the flow of sales; the rate at which disinvestment in inventories can proceed has wide latitude for variation.

Second, investment (or disinvestment) in inventories may be unintentional. Since "change in business inventories" depends upon the relationship between production and sales, any surprises about the rate of sales will leave the producer with more or less inventory than he had intended to hold. We can generally presume that the investments made in producers' durables were intended.

Third, there is a special difficulty about computing change in business inventories which, since it gives rise to an additional item in the national income accounts, will be taken up here rather than in the later sections of this chapter devoted to measurement problems.

Change in inventories is measured by comparing the value of the inventory stock at the beginning and the end of the accounting period. That measure is equivalent to subtracting the amount of outflow of inventories from the amount of inflow. If prices are unchanged during the

, the figure for inventory change will measure the physical change ntories. But changing prices can obscure the actual physical inven- ange, the result depending on the method used to value the in- y.[1]

The figure which appears in the product accounts for "change in ss inventories" has been adjusted from the value of the change ntories as it appears on the books of businesses to an estimate of rrent value of the physical volume of change in inventories. The it of the adjustment, called the "inventory valuation adjustment," lso appear as a correction to the measure of income created by the ction process—a point which will be reintroduced shortly.

### Net Foreign Investment

The relationship of the foreign sector to the national accounts will ered in detail in the next section, but a few general remarks on ture of net foreign investment should be introduced at this point. Goods and services produced by this country and exported are part national product of this country. So is the output of factors of ction owned by residents of this country but used in production l. The output of domestically owned factors used abroad is meas- y their income receipts.

Conversely, some part of the expenditures listed under "consump- "investment," or "government purchases" may have been im- and should not be counted as part of this country's product. Like- ny output produced with foreign-owned factors, as measured by e payments to those factors, is not part of this country's product. The deduction for imports and for factor-payments-to-abroad is from the total of exports and factor-payments-from-abroad. The

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The most frequently used method of valuing inventories is the so-called "first-in-first- "FIFO" procedure, which treats inventories as though they flow out in the same they flow in, so that the stock at the end of the period is priced at the most recent n a period of rising prices, an inventory which is unchanged in physical amounts e a higher value at the end than at the beginning of the period. The problem for the an is to determine whether there has been a physical change in inventories and then that change at current prices (since the rest of gross national product is also being t current prices). The calculation consists of expressing the end-of-period inventories ant prices, through the use of appropriate price indexes, and subtracting this figure ginning-of-period inventories in constant prices to get an estimate of physical volume The volume change in constant prices is then converted to current prices.

An alternative technique used by some firms for inventory accounting is the last-in- or LIFO method, in which inventories are treated as though they flow out in the order from that in which they flow in. Stable or increasing volumes of inventories are measured under this system by the change in the book value of inventory. But if



difference, if positive, represents an amount of product lent abroad or sold on capital account and therefore constitutes "net foreign investment." If the balance is negative, it can be called "net foreign disinvestment" or "net foreign borrowing."

### Components of Income

The process of production generates a flow of incomes which, in the aggregate, is equal to the total value of output. Total income can be broken down in a variety of ways. The classifications used in national income accounting attempt to meet the needs of both aggregative income theory and those areas of economic analysis which utilize data on functional distribution of income.

Table 3 shows, in the left-hand column, the components of gross national income, while the right-hand column repeats the production

TABLE 3

U.S. GROSS NATIONAL INCOME AND PRODUCT ACCOUNT, 1957
(Billions of Dollars)

| | | | |
|---|---|---|---|
| Compensation of employees | 254.6 | Personal consumption expenditures | 284.4 |
| Proprietors' and rental income | 54.8 | Gross private investment | 68.8 |
| Business, professional, and farm | 43.0 | Government purchases of goods and services | 87.1 |
| Rental income of persons | 11.8 | | |
| Corporate profits and inventory valuation adjustment | 41.9 | | |
| Corporate profits before tax | 43.4 | | |
| Inventory valuation adjustment | −1.5 | | |
| Net interest | 12.6 | | |
| Capital consumption allowances | 37.7 | | |
| Indirect business tax and nontax liability | 37.6 | | |
| Business transfer payments | 1.6 | | |
| Current surplus of government enterprises less subsidies | −1.3 | | |
| Statistical discrepancy | 0.7 | | |
| Gross National Income | 440.3 | Gross National Product | 440.3 |

Source: U.S. Department of Commerce, *Survey of Current Business*, July, 1958, Table 1.

data from Table 2. Such income items as "compensation of employees" and "net interest" need no further explanation. "Proprietors' and rental income"—the income of all unincorporated private enterprises—appears as a classification because, though it is actually made up of compensation for labor and returns to property, the accounting methods of unincorporated enterprises make it difficult, if not impossible, to separate them.

Under "corporate profits" we make a deduction for "inventory valu-

cted for an overstatement of change in inventories as measured by ›ook value of inventories. This same adjustment is made on the ne side, reducing corporate profits which were overstated by the ınt of the fictitious increase in inventories. (An adjustment for in-›ry valuation of unincorporated enterprises is also included in pro-ors' and rental income.)

"Capital consumption allowances" are an estimate of the amount e capital stock used up during the income period.

"Indirect business taxes" refers to all taxes which are not on income, as excise taxes, customs duties, and property taxes. The "nontax lity," an insignificant element, refers to such charges as fines, penal-and forfeitures.

"Business transfer payments" consist mainly of corporate gifts to ›rofit institutions and consumer bad debts. Other ingredients are per-l injury payments of business to persons other than employees, un-vered thefts, and cash prizes.

"Government enterprises" are defined as government agencies which heir output of goods and services to cover a substantial part of their ating costs. "Government subsidies" can be looked at as just the re-: of indirect business taxes and are, therefore, a deduction from the ne side of the Gross National Income and Product Account. The plus of government enterprises" is net of any losses of government rprises; and, since such losses represent subsidies to government en-ises, one form of government subsidy has already been deducted. complete the deduction, other government subsidies are also sub-ed from surplus of government enterprises.

Since gross national income and gross national product must be l by definition, any difference that arises between the separate statis-measurements of those two totals is entered under "statistical dis-ancy." The product estimate is treated as correct, and the discrepancy tered as an adjustment to the income estimate. The figure is generally al.

### *Gross National Product, Net National Product, and National Income*

In the section on gross national product, it was pointed out that is national product is in reality an overestimate of current output since ıcludes some product of a previous income period, in the form of a tion of the capital stock used up in producing the current product. : deduction of the capital consumption allowance from both sides of



conceptually superior to gross national product as an evaluation of current output. In practice, however, our view of the comparative merits of the two measures must be related to the confidence we feel in the capital-consumption-allowance estimate. Capital consumption allowances are based on the depreciation calculations of businesses which allow not only for the decline in physical productivity of capital assets but also for the decline in money value of assets due to obsolescence. For national income purposes, only the using up of capital as its productivity declines is relevant, so that capital consumption allowances as presently calculated are too large.

Net national product is measured in terms of the market value of current product. Alternatively, it can be measured in terms of the cost of the factors of production put in. But not all of the items appearing in the income column of the National Income and Product Statement are factor costs. Specifically, "indirect business taxes," "business transfer payments," "surplus of government enterprises less subsidies," and "statistical discrepancy" are not payments to factors for productive service. When they are deducted, we have net national product at factor cost, also called "national income," which is less than net national product at market prices. Actually the distinction between them makes very little difference. The figure for net national product is meaningful only in a comparative sense (for example, in a comparison of one year with another). If the relationship between net national product at market prices and at factor prices remains unchanged between the two years, then it makes no difference which concept is used. If, between the two periods, NNP at market prices increases by a greater proportion than NNP at factor prices, perhaps because of an increase in indirect business tax rates which raised market prices, it still does not matter which concept is used; a valid comparison requires that an adjustment be made for price changes between the periods being compared, and that adjustment wipes out the discrepancy introduced by the change in indirect business tax rates.

The choice between NNP at market prices and at factor prices is of consequence only in the case of an examination of NNP by industrial origin. In that case, the picture of the relative contribution of the various industries to total output may differ substantially when output is measured by market prices or factor costs.

## SECTOR ACCOUNTS

In broadest terms, the flows of current income in an economy can be described in this way. The production process generates a set of income

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ere will be some reallocation of income to other recipients *which are t payments for current products or services*. These reallocations are own as "transfer payments."

The original allocations are shown in the Gross National Income d Product Account (Table 3). To show the transfer payments, the onomy is divided into a number of sectors. The accounts of these sectors n then reveal, in addition to current product and the original income ocations, the transfers *between* sectors. Transfers within sectors are not own and are ignored. For this reason the choice of the sectors into ich the economy is to be divided is made so as to display those transfers at are of interest in income analysis and to leave out those that are not.

Each sector account shows the current receipts of the sector and w those receipts are allocated. Since these accounts show transactions tween sectors, one sectors' allocation is another sector's receipt. Each nsaction appears twice, as a receipt in one section and as an allocation another.

The United States' system of sector accounts divides the economy o three sectors: business, households, and government. A fourth ac- unt, the Rest-of-the-World Account, lists the transactions between the mestic economy and foreign economies. The system is completed with ifth sector, called the Gross Saving and Investment Account, which will quire a brief explanation.

Some transactions are current charges against current income, such consumption expenditures (an allocation of the household or personal ctor, a receipt of the business sector) or personal income taxes (a trans- r payment which is an allocation of the personal sector, a receipt of e government sector). But what accounting disposition shall be made any receipts of the personal sector over and above what are allocated consumption or to tax payments to the government? Such a residual, lled "personal saving," represents current income which is allocated, t to current use, but to a capital use. As such, it is not a transaction with her the business, government, or rest-of-the-world sector. Hence the Gross Saving and Investment Account" is set up for capital transactions, d personal saving becomes an allocation of the personal sector and a ceipt of the gross-saving-and-investment sector. The same principle lds for all transactions which are current to one party and capital to e other. Current income allocated to capital use becomes a receipt under aving" in the Gross Saving and Investment Account. Exchanges of *oduct* which are current to one transactor and capital to the other are receipt of the business sector and an allocation of the gross-saving-and-



A system of sector accounts is illustrated in Table 4. It follows the general pattern of the United States accounts but with some detail trimmed off for simplification.[2] The double entry of each item is shown by the matching numbers in parentheses. Hypothetical figures are used. A few comments on each sector account will suffice.

TABLE 4

A HYPOTHETICAL SET OF SECTOR ACCOUNTS
(Billions of Dollars)

*Business Income and Product Account*

| | | | | | |
|---|---|---|---|---|---|
| | Employee compensation: | | | Net sales to: | |
| (1) | Wages and salaries | 130 | (11) | Consumers | 150 |
| (2) | Employer contribution to social security | 3 | (18) | Government | 40 |
| (3) | Income of unincorporated enterprises | 22 | (28) | Business on capital account | 38 |
| | Corporate profits (after inventory valuation adjustment): | | (27) | Abroad | 4 |
| (4) | Corporate profits tax liability | 14 | (29) | Change in inventories | −1 |
| (5) | Dividends | 7 | | | |
| (6) | Undistributed profits | 7 | | | |
| (7) | Net interest | 4 | | | |
| (8) | Indirect business taxes | 23 | | | |
| (9) | Business transfer payments | 1 | | | |
| (10) | Capital consumption allowances | 20 | | | |
| | Charges against Business Gross Product | 231 | | Business Gross Product | 231 |

*Personal Income and Expenditure Account*

| | | | | | |
|---|---|---|---|---|---|
| | Consumer expenditures: | | | Wages and salaries: | |
| (11) | Purchases from business | 150 | (1) | From business | 130 |
| (12) | Purchases from abroad | 1 | (16) | From government | 25 |
| (13) | Net gifts (transfers) to abroad | 1 | (24) | From abroad | 1 |
| (14) | Personal tax payments | 30 | (3) | Income of unincorporated enterprises | 22 |
| (15) | Personal saving | 16 | | Dividends: | |
| | | | (5) | From business | 7 |
| | | | (26) | From abroad | 2 |
| | | | | Interest: | |
| | | | (7) | From business | 4 |
| | | | (22) | From government | 3 |
| | | | (25) | From abroad | 1 |
| | | | (9) | Business transfer payments | 1 |
| | | | (21) | Government transfer payments | 6 |
| | | | (31) | Less: Personal contribution to social security | −4 |
| | Allocations of Personal Income | 198 | | Personal Income | 198 |

[2] Items left out are: current surplus of government enterprises minus subsidies, excess of wage accruals over disbursements, foreign branch profits, statistical discrepancy, interest paid by households, and direct purchases of labor services by households.

TABLE 4–*Continued*

*Government Receipts and Expenditure Account*

| | | | |
|---|---|---|---|
| Purchases of direct services: | | Employer contribution to social security: | |
| Wages and salaries | 25 | (2) From business | 3 |
| Employer contribution to social security | 1 | (17) From government | 1 |
| Net purchases from business | 40 | (31) Personal contribution to social security | 4 |
| Net gifts (transfers) to abroad | 2 | (14) Personal tax receipts | 30 |
| Net purchases from abroad | 1 | (4) Corporate profits tax receipts | 14 |
| Transfer payments | 6 | (8) Indirect business taxes | 23 |
| Net interest paid | 3 | | |
| Government surplus (+) or deficit (−) | −3 | | |
| Government Expenditures and Deficit | 75 | Government Receipts | 75 |

*Rest-of-the-World Account*

| | | | |
|---|---|---|---|
| Net factor payments to the U.S.: | | Net purchases from abroad: | |
| Wages and salaries | 1 | (20) Government | 1 |
| Interest | 1 | (12) Personal | 1 |
| Dividends | 2 | Net unilateral transfers to abroad: | |
| Net sales by business to abroad | 4 | (19) Government | 2 |
| | | (13) Personal | 1 |
| | | (30) U.S. net foreign investment | 3 |
| Net Current Payments to the U.S. | 8 | Net Current Receipts from U.S. and U.S. Net Foreign Investment | 8 |

*Gross Saving and Investment Account*

| | | | |
|---|---|---|---|
| Business purchases on capital account | 38 | Gross business saving: | |
| Change in business inventories | −1 | (6) Undistributed corporate profits | 7 |
| Net foreign investment | 3 | (10) Capital consumption allowances | 20 |
| | | (15) Personal saving | 16 |
| | | (23) Government surplus or deficit | −3 |
| Gross Investment | 40 | Gross Saving | 40 |

## Business Gross Product

The bulk of gross national product originates in the business sector, ıot all of it. Purchases of direct services by government are part of ınt product. In addition, there is the income originating in the foreign r. One method of deriving gross national product from the sector ınts is given in Table 5.



TABLE 5

GROSS NATIONAL INCOME AND PRODUCT ACCOUNT
(Billions of Dollars)

| | | | |
|---|---|---|---|
| Charges against business gross product | 231 | Business gross product | 231 |
| Employee compensation from government | 26 | Government purchases of direct services | 26 |
| Net factor incomes from abroad | 4 | Net factor payments from abroad | 4 |
| Gross National Income | 261 | Gross National Product | 261 |

## Personal Income and Expenditure

Personal income is the total of household receipts of factor incomes (net of social security contributions) and transfer payments from government and business. Its relationship to gross national product can be observed in this alternative method of deriving personal income:

| | *Billions of Dollars* |
|---|---|
| Gross National Product | 261 |
| Less: Capital consumption allowances | −20 |
| Net National Product | 241 |
| Less: Indirect business taxes | −23 |
| National Income | 218 |
| Less: Corporate profits taxes | −14 |
| Social security contributions | −8 |
| Undistributed corporate profits | −7 |
| Plus: Government transfer payments (including government interest) | 9 |
| Personal Income | 198 |

The allocations of personal income include, first of all, the payment of personal income taxes. What remains of personal income after deduction of personal income taxes is called "disposable income," so that the descent from gross national product listed above can be extended another step:

| | |
|---|---|
| Personal Income | 198 |
| Less: Personal income taxes | −30 |
| Disposable Income | 168 |

## Government Receipts and Expenditures

Only one point of clarification remains to be made about the items in the Government Account and that is with respect to the treatment of government interest payments. Government interest, in the United States' accounting system, is considered not to be a factor payment but rather a transfer payment. It is not counted, therefore, in gross national income

t appears as a transfer from government to households in the sector
:ounts.

The reasoning behind the handling of government interest is briefly
s. All government purchases are considered to be on current account
that the government owns no capital stock. Hence, there can be no
tput from government property on the product side of the national ac-
ınts and no factor payments to capital, such as interest, in the alloca-
ns of national product.

To treat all government purchases as if they were consumed in the
ne period in which they were produced is obviously artificial, and the
ɔption of that accounting practice can only be explained in terms of
: difficulties that confront the statistician who must decide which gov-
ıment purchases are capital forming and which are not, and who must
imate the addition to national product to be ascribed to government
ɔital. Current discussion suggests that accounting methods will be
:ntually modified to recognize government capital formation, but the
ınge may be considerably delayed.

### *Rest-of-the-World Account*

This account shows the sales of current product and current factor
vices to abroad and the current purchases of products and factor serv-
; from abroad. Neglecting unilateral transfers for the moment, one
say that after these exchanges of goods and services have been netted
, any excess of sales to abroad represents a part of domestic product
t has been *lent* abroad.

However, the presence of unilateral transfers (gifts to abroad by
government or households) affects this picture. The transfers to
oad represent an amount of product which has not been lent but given.
deducting net unilateral transfers from the excess of sales to abroad,
amount that has been lent abroad, labeled "net foreign investment,"
omputed. Thus, in the Rest-of-the-World Account in Table 4, the
ess of sales over purchases from abroad is 6. But when unilateral trans-
; to abroad of 3 are deducted, net foreign investment is 3. The uni-
:ral transfers are treated as part of current product consumed by the
ıors (government or households); they are omitted from net foreign
:stment and chalked up as consumption.

### *Gross Saving and Investment*

Saving is the part of current income not allocated to consumption.
the sector accounts, total saving is subdivided among the three do-



i.e., capital consumption allowances and undistributed corporate profits. Personal saving is disposable income minus personal consumption. Government saving is government receipts, net of transfers, minus government consumption expenditures. The particular form in which savers may hold their savings (cash, savings accounts, reduced indebtedness, blast furnaces, etc.) is of no consequence to income accounting.

For every dollar of income there is a dollar of current product, and, so, for every dollar of income not consumed (saving), there is a dollar of product not consumed, which is investment. Total investment, composed of business purchases on capital account (producers' durables), change in business inventories, and net foreign investment, must equal total saving.

## NATIONAL INCOME ACCOUNTS AS MEASURES

To this point we have been concerned with national income accounts primarily as a framework on which to build the theory of income analysis. But income accounts are also used as measures when statisticians make estimates and put numbers into the accounts. Since these numbers are likely to be widely used, some attention to what they measure is worthwhile.

### *Inclusions and Exclusions*

A completely comprehensive measure of gross output would include the results of all activity in the nation that produces something of value. Actual measures are a considerable compromise with the completely comprehensive concept.

The type of product which is easiest to include is product that is sold, since the amount for which it is sold provides a figure at which it can be valued.

In addition, the United States' accounts contain an estimated amount of product (and a corresponding amount of income) which was either given to the consumer or consumed directly by the producer. There being no market valuation for these products, a value must be imputed to them. Imputed products in the American statistics cover payment in kind (food, certain types of clothing, and lodging) to employees, net rent of owner-occupied dwellings, services of financial intermediaries (banks, investment trusts, and life insurance companies), and food and fuel produced and consumed on farms.

But these imputed items which are included are small compared to

duct. First, we have the vast amount of productive activity carried by members of households for themselves—cooking, housekeeping, d-care, transportation in private passenger cars, and the whole range 'do-it-yourself" projects like clothes-making, carpentry, and house- ting. This output in households is produced not by labor alone, but abor working with a variety of equipment which we classify under sumers' durables," but which would be called "investment" if we ted its product in national product. Second, there is the product of rnment-owned durables which could be imputed if the government isition of those durables were treated as investment rather than con- ption.

The likelihood that the handling of government durables will some- be revised has already been mentioned. What of the excluded items ousehold production?

The difficulty of estimating the value of these household products rtainly great though perhaps not much different in nature from the lem of estimating farm production consumed by farmers. A more us question arises when we ask where the process of imputation is id. If we include housekeeping, should we not also include combing s hair, swinging in a hammock, or kissing, all activities producing umer satisfaction. A line must be drawn somewhere. Wherever it is vn, it will reflect not water-tight logic but pragmatism.

One aspect of the choice between inclusion and exclusion is con- ncy. If a particular kind of product, say the housing service of a lling, were to be excluded from national product when it is occupied ne owner but included when occupied by a tenant, the inconsistency ld be glaring. So it is with the omission of personal production of sportation service while counting transportation produced in the busi- sector. Our present practice of including the services of hired house- ers but excluding the housekeeping services of members of the house- is inconsistent but not glaringly because paid housekeeping is such all proportion of total housekeeping. In excluding swinging in a ham- k, there is no inconsistency.

More important than inconsistency is the correctness of the picture eyed by the data. It must be kept in mind that the absolute amount me figure, gross national product for example, means little if any- g. It takes on meaning only in a comparison. If you were told that year the GNP of country X was 642, you would be entitled to look k. But if you were also told that, in the previous year, GNP had been your eyes would gleam with intelligent curiosity about the decline



with other time periods and with other economies. In each case, the excluded production creates a potential source of misinformation.

If an economy is undergoing structural changes which shift significant amounts of production between the included and excluded category, income data can give a misleading impression of trends through time. For example, in a country which is moving from a condition in which food, clothing, home furnishings, and entertainment are produced in the household to one in which these items are largely produced in the business sector, income data which exclude home production will show an exaggerated rate of growth. The reverse movement of production from the business sector to households is illustrated by the relative decline of passenger transportation by public carriers and the rise of transportation by private automobiles in the United States.

International comparisons are similarly obscured. The difference in per capita income between two countries, one of which produces in the home a great deal which the other produces in the business sector, will be overstated. Comparisons of rates of investment may be falsified if some countries include government investment and others do not; or if neither recognizes government investment, and purchases of such government durables are relatively more important in one country than the other; or if "consumer investment," ignored in both, is substantial in one and small in the other.

It may be that for most of the uses to which national income data will be put, the incomplete coverage will make a negligible difference; but an awareness of the limits of the statistics should keep the user alert for those cases where comparisons are vitiated by the accounting methods employed.

### National Income and Welfare

That no direct relationship can be inferred between the level of national income, as now measured, and the level of national welfare is fairly obvious. The omission from income data of certain outputs that add to satisfaction has just been mentioned. The distribution of national income has much to do with the welfare it affords. Furthermore, the prices at which product is valued may not reflect its contribution to the community's satisfaction as might be the case with lavish public monuments or surplus agricultural products consigned indefinitely to storage.

Beyond these sources of discrepancy between income and welfare, there are some that are not quite so obvious. One such has to do with output which is produced solely to meet the needs created by the com-

portation of goods and of workers is a large output item in a modern economy, where in a primitive economy the proximity of workers, producers, and consumers may keep transport activity small. In welfare terms, the greater transport of the modern economy represents not an output but a *cost* and, in a comparison of welfare between the two countries, a corresponding deduction from the output of the modern economy (or an addition to the output of the primitive economy) should be made. A great deal of packaging, advertising, clerical, and administrative costs also falls into this category. A crude comparison of national income statistics between two quite different types of economies may exaggerate the welfare difference.

Another cost for which some deduction should be made in welfare estimates is "human cost." A reduction in the arduousness of labor, in the disagreeableness of working conditions, or in the danger of injury or illness from work ought to be reflected in the increased welfare value of a given output. Likewise, a shortening of hours worked means a decrease in the human cost of output, or, if one prefers, an increased output of "leisure," which ought to appear in any net output figures that are intended to bear on national welfare.

### *Income Comparisons and the Index Number Problem*

Some difficulties of income comparisons arising from accounting definitions and methods have been mentioned. Now a difficulty of another sort, inherent in the problem regardless of the accounting methods used, must be introduced.

The sum of a great variety of different products can be obtained only by using some common unit of measure for each, which in practice means valuing each product at its market price or some approximation to a market price if the product is imputed. A national product figure, therefore, is compounded of a set of product quantities and a set of prices, and the analyst must wrestle with the problem of sorting out the influence of each.

### *Intertemporal Comparisons*

To interpret intelligently a change in national income between two points in time, it is necessary to know how much of the change is attributable to quantity variation and how much to price variation. The two can be separated if we can hold prices constant, i.e., multiply quantities by the prices that prevailed in the first (or base) period or the prices of the second (or current period) or by some other given set of prices. An income series measured in constant prices is generally referred to as a measure of "real income."



Unfortunately, it can make a considerable difference which set of prices is chosen. In Table 6 we have figures for a hypothetical economy producing only two products, steel and wheat. The total value of output increased eightfold between Periods 1 and 2:

$$\frac{P_2Q_2}{P_1Q_1} = \frac{\$1,600}{\$200} = 8,$$

but part of that increase resulted from a rise in prices. To measure the change in real output, we can measure output in the constant prices of

TABLE 6

MEASUREMENT OF OUTPUT CHANGE (ALTERNATIVE CONSTANT PRICES)

| | Units of Product | | Price | | Value of Product | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Period 1 Prices | | Period 2 Prices | |
| | Period 1 ($Q_1$) | Period 2 ($Q_2$) | Period 1 ($P_1$) | Period 2 ($P_2$) | ($P_1Q_1$) | ($P_1Q_2$) | ($P_2Q_1$) | ($P_2Q_2$) |
| Steel | 10 | 100 | $10 | $10 | $100 | $1,000 | $100 | $1,000 |
| Wheat | 10 | 20 | 10 | 30 | 100 | 200 | 300 | 600 |
| | | | | | $200 | $1,200 | $400 | $1,600 |

Period 1. Then output in the first period is valued at \$200 ($= P_1Q_1$) and in the second period at \$1,200 ($= P_1Q_2$), a sixfold increase. Or we can use constant prices of Period 2, giving a value of \$400 ($= P_2Q_1$) in Period 1 and \$1,600 ($= P_2Q_2$) in Period 2, a fourfold increase.

Did real product increase by 6 times or 4 times? The difference arises because wheat, which had a much smaller increase in quantity of output than steel, is given more weight in the final average when it is valued at the higher price of Period 2 than when it is valued at the lower price of Period 1. The two measures of the increase of product are equally correct, for, since both sets of price weights are equally defensible logically, there is no basis on which to choose between the two outcomes.

In this index of volume of output or in any other index in which two or more items must be averaged, the choice of weights must have an element of arbitrariness, and more than one "correct" answer can emerge. This is the index number problem. The example given in Table 6, however, is an extreme case; in practice, base and current period weights will often yield very similar index numbers, so that the horns of the statistician's dilemma are considerably blunted.

Another difficulty in making index numbers arises from the introduction of new products, or changes in the quality of existing products.

If, for example, products in the index are replaced by others of superior quality, the quantity of the improved product ought, ideally, to be adjusted to reflect the increased capacity of the product to yield satisfaction. Index makers of the U.S. government do attempt to make an adjustment for quality changes, but comparisons of quality are often very difficult. The difficulty is particularly acute in the case of services; ordinarily no adjustment is attempted. In an economy which tends generally in the direction of quality improvement, there is likely to be an insufficient allowance for that improvement and a downward bias in the index of aggregate output.

### *Intercountry Comparisons*

Let us suppose that the data in Table 6 pertain to some country A which we want to compare to country B having the following outputs and prices in Period 2:

| | Units of Product ($Q_2$) | Price ($P_2$) | Value of Output ($P_2Q_2$) |
|---|---|---|---|
| Steel | 20 | 100 pesos | 2,000 pesos |
| Wheat | 80 | 50 | 4,000 |
| | | | 6,000 pesos |

How can these incomes be compared? One method often used is to employ the official exchange rate of currencies to convert the national product of one country into the currency of the other. In this example, if the exchange rate were 6 pesos to $1, the income of country B in Period 2 could be expressed as $1,000 and compared to the income of A of $1,600. But the conversion by application of exchange rates does not inspire confidence because exchange rates are often very far from reflecting the relative purchasing power of each currency in its own economy.

An alternative method that has been tried is to value the output of one country by the prices that apply to the same commodities in the other. In the example above, we could value B's output of steel (20 units) by A's price of steel ($10) and B's output of wheat (80 units) by A's price of wheat ($30), arriving at a total value of output of $2,600, which exceeds the value of A's output of $1,600. Or we might value A's steel (100 units) and wheat (20 units) at B's prices of 100 and 50 pesos respectively, reaching a total value of output of 11,000 pesos—almost twice B's 6,000-peso income.

Thus A appears to have either a lower or a higher income than B, depending on which set of weights is applied. Again, actual comparisons will ordinarily not present such extreme results, though the discrepancies will often be quite large.

TABLE 7

INTERCOUNTRY COMPARISONS OF OUTPUT CHANGE

| | Units of Product in Country A or B | | Prices in Period 2 | | Value of Product | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Country A | | Country B | | | |
| | Period 1 ($Q_1$) | Period 2 ($Q_2$) | Country A ($P_{2A}$) | Country B ($P_{2B}$) | Period 1 ($P_{2A}Q_1$) | Period 2 ($P_{2A}Q_2$) | Period 1 ($P_{2B}Q_1$) | Period 2 ($P_{2B}Q_2$) |
| Steel | 10 | 100 | $10 | 100 pesos | $100 | $1,000 | 1,000 pesos | 10,000 pesos |
| Wheat | 10 | 20 | 30 | 50 | 300 | 600 | 500 | 1,000 |
| | | | | | $400 | $1,600 | 1,500 pesos | 11,000 pesos |
| Per cent increase | | | | | 300% | | 633⅓% | |

### Intercountry-Intertemporal Comparisons

It is often desired these days to compare rates of growth among countries. Here, again, one of the numerous obstacles is the index number problem.

Assume that countries A and B have identical production data, represented by the quantities in Table 7, but the price structures differ.

As Table 7 illustrates, two countries with the same production quantities will appear to have quite different rates of increase in value of product if the prices we use weight the more rapidly growing outputs more heavily in one economy than the other. This ambiguity can be avoided if the quantities in both countries can be weighted by the same price structure. In the case just cited, A and B will show the same rate of growth, 300 per cent, if quantities in both countries are priced at country A's prices. Of course, a question about the rate of growth remains, since, in country B's prices, both countries have increased value of product by 633 per cent. But at least the same rate of growth will be shown for two countries with the same quantity statistics.

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## QUESTIONS

1. Explain why the following transactions are not included in investment in national income accounting:
   *a*) The purchase of bonds or common stocks.
   *b*) The purchase of land.
   *c*) The purchase of used machinery.



2. What is the difference between the purchase of intermediate goods and investment?
3. Is the position of the government sector in the flow of national income and product more like that of the producing sector or the consuming sector? How does the treatment of the government sector in the U.S. income accounting system differ from the treatment of the producing (business) sector?
4. Why do certain transactions such as personal income tax payments appear in the sector accounts but not in the Gross National Income and Product Account? What kinds of transactions do not appear in the sector accounts?
5. What is the difference between net sales of goods and services to abroad and net foreign investment?
6. Compute gross national product, disposable income, personal saving, government purchases of goods and services from the following data:

| | |
|---|---|
| Total factor incomes | 200 |
| Total taxes | 40 |
| Consumption | 150 |
| Capital consumption allowances | 20 |
| Government transfer payments | 8 |
| Business transfer payments | 1 |
| Total investment | 35 |
| Undistributed corporate profits | 5 |
| Indirect business taxes | 7 |